

REMARKS

Favorable reconsideration of this application is respectfully requested in light of the following remarks, wherein Claim 1 is amended and new Claims 19-25 are added to the application. Currently, Claims 1-25 are pending in the present application.

Claims 1-15 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,369,848 to *Salmi et al.* Claims 1-7 and 10-18 stand rejected under 35 U.S.C. §102(b).

Independent Claim 1 recites a hydraulic system for mining equipment comprising at least one hydraulic circuit with pressure fluid channels and at least one hydraulic pump; the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit; at least one power unit for driving the hydraulic pump; at least one hydraulic mining actuator connected to the hydraulic circuit and configured to act on a tool in the mining equipment; at least one hydraulic auxiliary actuator connected to the hydraulic circuit; and means for adjusting the hydraulic power to be led to the mining actuator and the auxiliary actuator connected to the hydraulic circuit, wherein the hydraulic system comprises a main hydraulic circuit and at least one separate hydraulic circuit, and the main hydraulic circuit and each separate hydraulic circuit are operationally separate from each other, each having a separate hydraulic pump for generating hydraulic power; at least one mining actuator is connected to the separate hydraulic circuit and said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted by adjusting the power of the drilling actuator connected to the separate hydraulic circuit by adjusting the generated hydraulic power by adjusting the pumping output of the hydraulic pump.

Independent Claim 11 recites a method of adjusting the power of a rock drill machine, the rock drill machine comprising at least the following drilling actuators: a percussion device a rotation device and a feed device of which at least one is connected to a hydraulic circuit method comprising: generating hydraulic power in said hydraulic circuit with at least one hydraulic pump; driving the drilling actuator connected to the hydraulic circuit by the hydraulic power acting in the hydraulic circuit; adjusting the power of the drilling actuator connected to the hydraulic circuit by adjusting the hydraulic power to be fed to the drilling actuator; and adjusting the power of the drilling actuator connected to the hydraulic circuit mainly by adjusting the pumping output of the hydraulic pump. None of the art of record disclose these patentable features.

On page 4 of the Office Action, the Examiner concedes that, in *Salmi*, the hydraulic circuits are co-dependent in their operation. However, the Examiner asserts that the circuits are separate, because they are distinguishable from one another in that each respective circuit has a distinct configuration for the purpose of operating a distinct component of the hydraulic system.

In *Salmi*, the circuits are not only operationally but also physically co-dependent. For example, a striking apparatus (3) receives pressure medium from a pump (6) and the same pump also delivers pressure medium to a feed motor (5). Furthermore, the feed motor (5) receives pressure medium from pump (10), which delivers pressure medium to a rotation device (4). This is clearly shown in Figure 1. Thus, the pressure circuits of *Salmi* are not separate.

Moreover, in the hydraulic circuit of *Salmi et al.*, there are adjusting components in the pressure channels. For example, there is a pressure-reducing valve (17) in a channel (14) for reducing the pressure fed to the feed motor (4). Column 3, lines 13-16 of *Salmi et al.*

Furthermore, the operation of the actuators of *Salmi et al.* are controlled by means of pressure-controlled valves (23). Column 3, lines 24-37 of *Salmi et al.* In the valve (23), the return line is also choked, as is mentioned in column 3, lines 4-6. Thus, in the *Salmi et al.* patent, there are adjustment components in the hydraulic system.

As such, *Salmi et al.* fails to disclose that the power of the mining actuator is adjusted by adjustment in the hydraulic power generated by the hydraulic pump. Because there are adjusting components arranged in the hydraulic channels in the *Salmi et al.* device, there is no need to adjust the power of the mining actuator by adjusting the pump. In the present invention, the performance of mining actuators connected to the separate hydraulic circuit is controlled by means of one or more hydraulic pumps. *Salmi et al.* document fails to disclose or suggest such power control. Accordingly, *Salmi et al.* fails to disclose the patentable features of independent Claims 1 and 11.

Saha discloses in Figure 2, a drilling system including a percussion device (4), a rotating device (5), a feeding device (9), and a flushing device (11). The actuators are connected to a respective feed pump (12), impact pump (13), rotation pump (14), and a flushing pump (21), which pumps are driven by motors 12a, 13a, 14a, and 21a. The motors are controlled by a control unit (28).

However, on page 2 in chapter [0024] last nine lines, it is mentioned that: "For the sake of clarity, Fig. 2 does not show control valves used for the control of the percussion device (4), rotating device (5), feeding device (9) and flushing device (11). Further, it is mentioned that the structure and operation of the drilling system is well known to a person skilled in the art." As such, *Saha* discloses a conventional drilling system including adjusting components, such as valves, in the pressure channels in order to adjust the power of the devices (4, 5, 9 and 11).

Further, as shown in Figure 2, all the pumps (12, 13, 14 and 21) are provided with a fixed displacement. This is clear for a man skilled in the art on the basis of the drawing symbols used in Figure 2 of *Saha*. Furthermore, there is no disclosure or teaching that the displacement of the pumps could be adjusted. On the contrary, Figure 2 shows that control unit (28) controls the motors (13a, 14a, 21a) of the pumps. By controlling the motor, it is possible to affect the speed of rotation of the pump, which influences only the flow obtained. Normally, it is not possible to adjust the pressure obtained by adjusting the motor of the pump.

As such, *Saha* fails to disclose that the power of the mining actuator is adjusted by adjustment in the hydraulic power generated by the hydraulic pump. Because there are adjusting components arranged in the hydraulic channels in the *Saha* device, there is no need to adjust the power of the mining actuator by adjusting the pump. In the present invention, the performance of mining actuators connected to the separate hydraulic circuit is controlled by means of one or more hydraulic pumps. Accordingly, *Saha* fails to disclose the patentable features of independent Claims 1 and 11.

New independent Claims 19-25 are also added to the application. New Claim 19 incorporates the features of independent Claim 1 and Claim 17. New Claim 20 incorporates the features of independent Claim 1 and Claim 18. These claims were only rejected in view of *Saha*.

In addition to the distinguishing features discussed above with respect to independent Claim 1, Claims 19 and 20 include additional features that distinguish it from the *Saha* reference. In particular, *Saha* discloses to arrange pressure sensors (24, 25, 26) in feed channels and to measure only pressure. There is no disclosure or any teaching to measure pressure and flow of the fluid in the feed channel (claim 19) nor is there any disclosure of

teaching to monitor the operation of the drilling actuator by a sensor arranged in connection with it (new claim 20). Accordingly, *Saha* fails to disclose the patentable features of independent Claims 19 and 20.

New independent Claims 21 and 22 incorporate the features of independent Claims 1 and 11, respectively, but also further recite that wherein the power of the mining actuator connected to the separate hydraulic circuit is arranged to be adjusted only by adjusting the pumping output of the hydraulic pump. As discussed above, *Saha* fails to disclose these patentable features.

New independent Claim 23 incorporates the features of independent Claim 1 and Claim 2. As discussed above, in *Saha*, the hydraulic pumps are fixed displacement pumps whereby it is possible to adjust only fluid flow. This is why *Saha* mentions that valves are arranged in the feed channels. By means of the valves and other adjusting components, it is possible to adjust the pressure of the fluid. However, the hydraulic pressure is not adjusted by the hydraulic pump, as recited in independent Claim 23. *Salmi et al.* also fails to disclose this feature. Accordingly, both *Saha* and *Salmi* fails to disclose the patentable features of independent Claim 23.

New independent Claim 24 incorporates the features of independent Claim 1 and Claim 12 and new independent Claim 25 incorporates the features of independent Claim 1 and Claim 14. New Claims 24 and 25 both recite to adjust the displacement capacity of the pump in order to adjust the power of the drilling actuator. Both *Salmi* and *Saha* fail to disclose this patentable feature. Accordingly, both *Saha* and *Salmi* fails to disclose the patentable features of independent Claims 24 and 25.

For at least the foregoing reasons, it is submitted that the method and device of independent Claims 1, 11, and 19-25, and the claims depending therefrom, are patentably

distinguishable from the applied documents. Accordingly, withdrawal of the rejections of record and allowance of this application are earnestly solicited.


Should any questions arise in connection with this application, or should the Examiner believe a telephone conference would be helpful in resolving any remaining issues pertaining to this application, it is respectfully requested that the undersigned be contacted at the number indicated below.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 50-0573. This paragraph is intended to be a CONSTRUCTIVE PETITION FOR EXTENSION OF TIME in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully Submitted,

Date: March 11, 2008
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